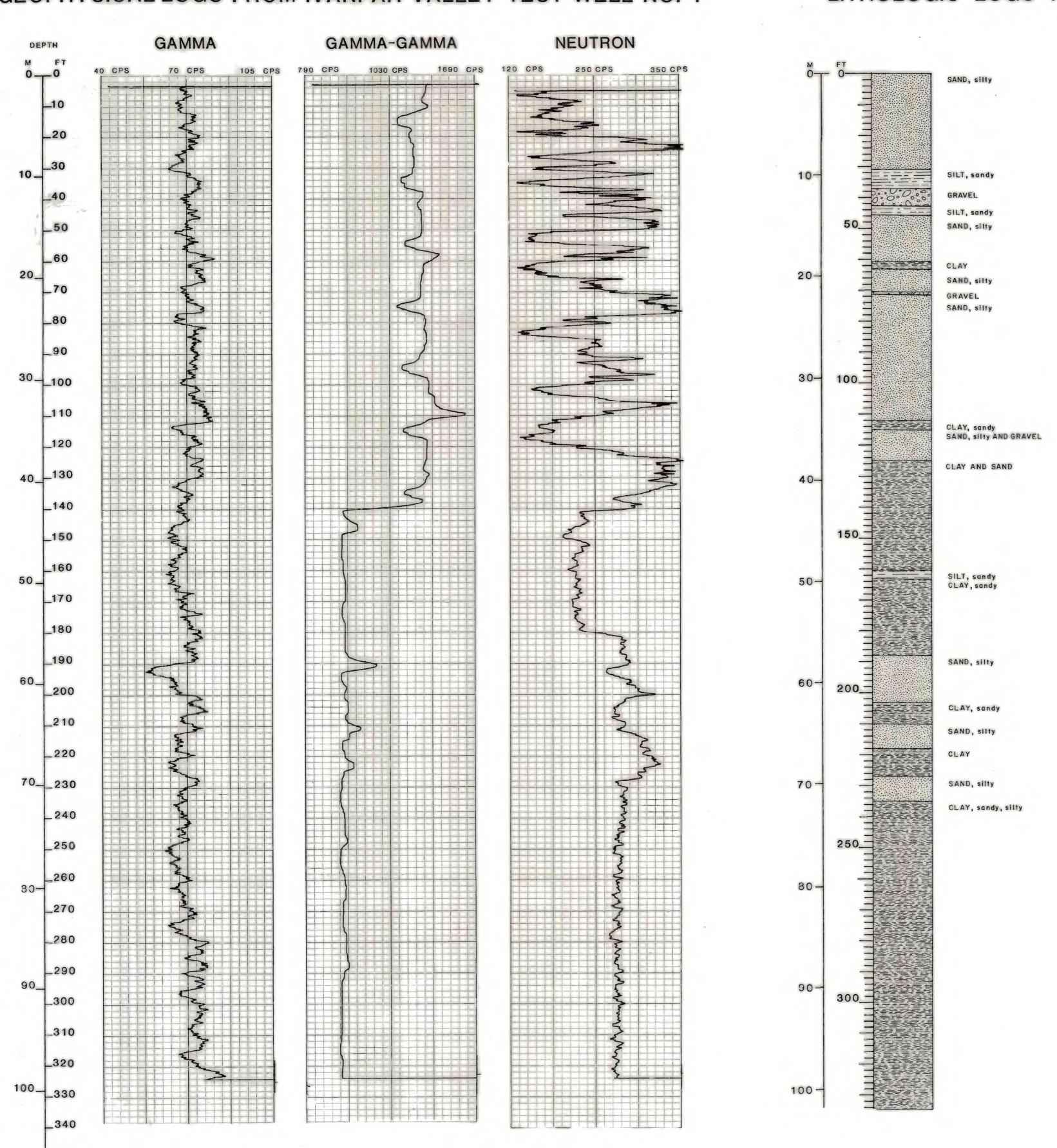
L350

CALIFORNIA

GEOPHYSICAL LOGS FROM IVANPAH VALLEY TEST WELL NO. 1

LITHOLOGIC LOGS FROM IVANPAH VALLEY TEST WELL NO. 1



	Depth (Feet)			ers)	Description				
0	- 31	0	-	9.4	SAND, silty, pale-yellowish-brown (10YR 6/2) and very pale orange (10YR 8/2) to grayish-orange (10YR 7/4), very fine, rare (± 1 percent) granules and pebbles. Unit includes thin (less than 1.0 ft, 0.3 m) gravel bed at 17 ft (5.2 m)				
31	- 37	9.4	-	11.3	SILT, sandy, moderate-yellowish-brown (10YR 5/4)				
37	- 43	11.3	-	13.1	GRAVEL, rounded to subangular granitic and andesite pebbles, 0.1 - 2 in. (2 - 51 mm) maximum dimension, with dark-yellowish-brown (10YR 4/2) sandy silt matrix				
43	- 45	13.1	•	13.7	SILT, sandy, moderate-yellowish-brown (10YR 5/4)				
45	- 73	13.7		22.3	SAND, silty, moderate-yellowish-brown (10YR 5/4), very fine, occasional very coarse sand and granule gravel beds. Unit includes interbed of moderate-yellowish-brown calcareous CLAY at 63 - 65 ft (19.2 - 19.8 m)				
73	- 73.	.5 22.3	-	22.4	GRAVEL, subrounded granitic pebbles, 0 2 - 0.8 in. (4 - 20 mm) maximum diameter				
73.5	- 112	22.4	-	34.1	SAND, silty, grayish-orange (10YR 7/4) to moderate-yellowish-brown (10YR 5/4), very fine to medium, rare ([±] 1 percent) granitic granules				
112	- 115	34.1	-	35.1	CLAY, sandy, grayish-orange (10YR 7/4)				
115	- 125	35.1	•	38.1	SAND, silty, moderate-yellowish-brown (10YR 5/4), fine to medium, and 10 percent GRAVEL of subrounded granitic pebbles (0.4 - 0.8 in. 10 - 20 mm) maximum dimension				
125	- 163	38.1	-	49.7	CLAY, grayish-orange (10YR 7/4) and very pale orange (10YR 8/2), calcareous, mixed equally with moderate-yellowish-brown (10YR 5/4) very fine to fine silty SAND				
163	- 165	49.7	-	50.3	SILT, sandy, red brown				
165	- 188	50.3	-	57.3	CLAY, sandy, moderate-yellowish-brown (10YR 5/4), calcareous				
188	- 203	57.3	-	61.9	SAND, silty, dark-yellowish-brown (10YR 4/2), very fine to medium, rare (-1 percent) granules at 195 - 200 ft (59.4 - 61.0 m)				
203	- 210	61.9	-	64.0	CLAY, sandy, same as interval 165 - 188 ft (50.4 - 57.3 m)				
210	- 218	64.0	-	66.4	SAND, silty, moderate-yellowish-brown (10YR 5/4), fine to medium				
218	- 227	66.4	-	69.2	CLAY, grayish-orange (10YR 7/4), calcareous				
227	- 235	69.2		71.6	SAND, silty, grayish-orange (10YR 7/4), very fine to medium, and 10 percent granules				

71.6 - 102.1

CLAY, sandy, silty, moderate-yellowish-brown (10YR 5/4), calcareous. IV-1-1 collected

at total depth

INTRODUCTION

Geophysical, lithologic, and water quality data from Ivanpah Valley, California, were obtained in July, 1978. These data provide leasable mineral resource input to the Bureau of Land Management's comprehensive long-range plan, authorized by the Federal Land Policy and Management Act of October 21, 1976 (Public Law 94-579), for the management, use, development, and protection of public lands within the California Desert Conservation Area (index map).

DRILLING AND LITHOLOGIC LOGGING TECHNIQUES

The test well was completed by the reverse circulation drilling technique. Drilling fluids, either air or water or both, are pumped down the outer annulus of dual-wall drill pipe to an open-throat button bit. The drilling fluids and cuttings then are forced up the inner annulus of the drill pipe to the surface. This technique assures recovery of uncontaminated sediment and water samples. In situ ground water is used as a drilling fluid as much as possible; otherwise a fine mist of imported fresh water and air is used.

Lithologic characteristics of the samples of the drill cuttings are described in the field. Field descriptions are later supplemented by laboratory examination. The rock color chart (Goddard and others, 1948) is used to color classify damp to wet samples. Sediment names are described by Wentworth (1922). Percentage of lithologic constituents listed in the lithologic description are approximate. "No Recovery" is used where samples are not collected. collected.

WATER QUALITY

Water samples are collected at the first aquifer with significant flow and at total depth (T.D.) by stopping drill rotation and pumping air through the drill string. The aquifer is allowed to flow for several minutes before a water sampled is collected. The water temperature, pH, and specific gravity of raw and filtered untreated samples are measured in the field.

GEOPHYSICAL LOGGING TECHNIQUES

Radioactive geophysical logs, including gamma, gamma-gamma, and neutron logs, are obtained from the land surface to a depth of 98.8 m (324 ft). Radioactive logs are run through the drill pipe because the playa sediments would squeeze in and heal the test well before conventional electric logs could be completed in a open test well. Total thickness of the dual-wall drill pipe is 15.88 mm (0.63 in.) The radioactive source of the gamma-gamma log is Cesium (Cs¹³⁷); Americium-Beryllium (Am²⁴¹-Be) source is used for the neutron log.

GEOPHYSICAL LOGGING PARAMETERS

Natural Gamma Gamma-Gamma

			CONTRACT STREET, STREE
Scale switch (CPS)	0-50	0-500	0-100
Time constant (seconds)	4	4	4
Position potential (dial division)	10.0	4.0	7.0
Sensitivity potential (span: dial division)	10.0	7.0	5.0
Input pulse (volts)	1.2	1.2	1.2
Polarity (N = Negative, P = Positive)	N	N	N
Logging speed (ft/min)	17	17	17
Tool length (ft)	2.8	2.8	4.5
Source spacing (in.)		16	6

ACKNOWLEDGMENTS

G. Thomas Server provided laboratory lithologic descriptions. Geophysical logging was performed by James Cathcart of the Office of Energy Resources, U.S. Geological Survey, Denver, Colorado.

REFERENCES

Goddard, E.N., chm, and others, 1949, Rock-color chart: National Research Council; reprinted by Geological Society of America, 1951, 1963, 1970,

Wentworth, C.K., 1922, A scale of grade and class terms for clastic sediments: Journal of Geology, v. 30, p. 377 - 392.

WATER QUALITY DATA FROM IVANPAH VALLEY TEST WELL NO. 1 (Analyses by U.S. Geological Survey, Water Resource Division, Denver Colorado)

Test Well	Date collect		Depth of water sample (ft)	Water temperatur (°C)	re lab	—pH—— field	- i	Specific gravity	Specific conductance (microhms/cm at 25 C)	Percent sodium	SAR* (sodium absorption rate)
IV-1	7/10/78		335	24.8	8.5	8.4		1.005	362	65	2.9
						sults in					
Test Well number	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Phosphorus (P)	Sulfate (SO ₄)	Chloride (CI)	Fluoride (F)	Total Nitrate (NO ₂ +NO ₃)	Iodide (I)
IV-1	15	17	3.0	50	3.0	0.01	45	33	0.9	1.8	0.03
					R	esults in mg/L					
Test Well	Bicarbonate (HCO ₃) ⁺	Mangane (Mn)	ese Iron (FE)	Boron (B)	Lithium (Li)	Strontium (Sr)	Uranium (U)	Solids, residue on evaporation at 180 C (TDS)	Total Alkalinity Calcium Carbonate (CaCO ₃)	Total hardness	Percent Difference
IV-1	88	0	0.130	0.090	0.020	0.510	0.002	215	72	55	-1.98
* SAR 10 10-18	Water Classi Excell	lent		***************************************						,	

TEST WELL LOCATION Latitude: 35°25′46″ Longitude: 115°19′54″ SE\ne\ Sec. 35, T. 15\ N., R. 15 E.

San Bernardino Meridian

CALIFORNIA DESERT

0 5 10 MILE 0 5 10 KILOMETER

GEOPHYSICAL, LITHOLOGIC, AND WATER QUALITY DATA FROM IVANPAH VALLEY, SAN BERNARDINO COUNTY, CALIFORNIA

Calculated.